SERIES
30

PENNSYLVANIA GAS FURNACES

Bulletin No. 10

MANUFACTURED BY

Pennsylvania Furnace & Iron Co.
Warren, Pa.

Basic or Class A PENNSYLVANIA Furnace

THE MODEL 30 PENNSYLVANIA GAS FURNACE

Almost half a century ago—forty-six years to be exact—the first Pennsylvania Gas Furnace was manufactured. There is nothing to boast of in years alone, but years do bring experience. A gas furnace that was so scientifically designed that it is still a market leader almost fifty years later is something to talk of in these days of change.

Likewise an organization with half a century of practical heating experience from father to son and from inventing to manufacturing and installing is on firmer ground than a new group with ideas and designs untried over a long term of years.

In early days natural gas was both plentiful and cheap. Yet, even then, the Pennsylvania was known as the most economical furnace. It has maintained that reputation ever since.

Gas furnaces of other makes that were on the market in those days are unheard of today, because they were lacking in those features necessary to a good gas furnace; namely, fuel economy, care-free operation, long life and reasonable cost.

The Pennsylvania Gas Furnace is the oldest furnace on the market. It also holds the record among both gas and coal furnaces for its durability. There are Pennsylvania Gas Furnaces in use today that have been in continuous operation for the past thirty-five to forty years with practically no repairs. This record cannot be equalled.

The Model 30 Pennsylvania Gas Furnace is the latest improved model of the original Pennsylvania combining all the good features of the early design with the improvements of later research and experience. Briefly, these points are.

1. Thin walls for rapid heat transfer.
2. Long spiral fire travel with no down draft.
3. Large and finely divided radiating surface.
4. Exceptionally long life by reason of absence of overheating and condensation.

These combine **heating efficiency** and **satisfactory operation** with practically **no expense for repairs.** A combination you can not beat in a heating plant at any price.

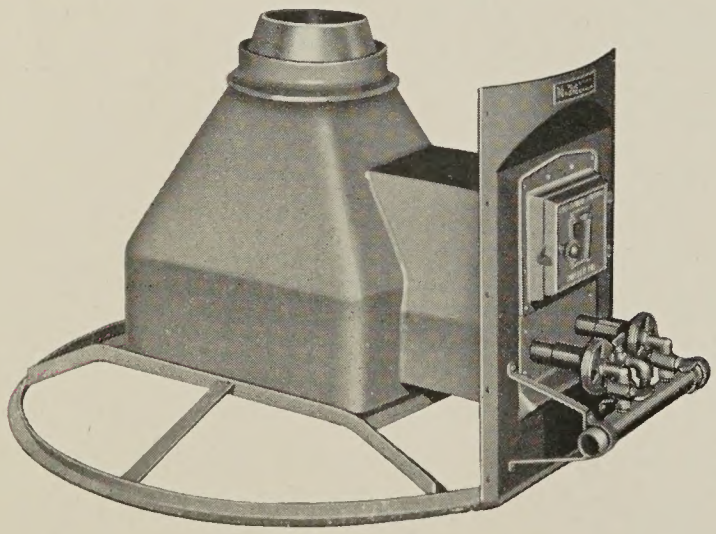
The Series 30 Pennsylvania Gas Furnace is manufactured in seven sizes. The smallest has a BTU input capacity of 60,000, the largest 270,000. In addition to the regular style they are also made in the pipeless style. They are equally adaptable for heating homes, churches, schools, stores, and other public buildings.

Construction of the Series 30 Pennsylvania Gas Furnace

This model of the Pennsylvania Gas Furnace is circular in section, enclosing cylindrical heating surfaces. This has always been recognized as one of the most efficient means of heating evenly all the air passing through the furnace.

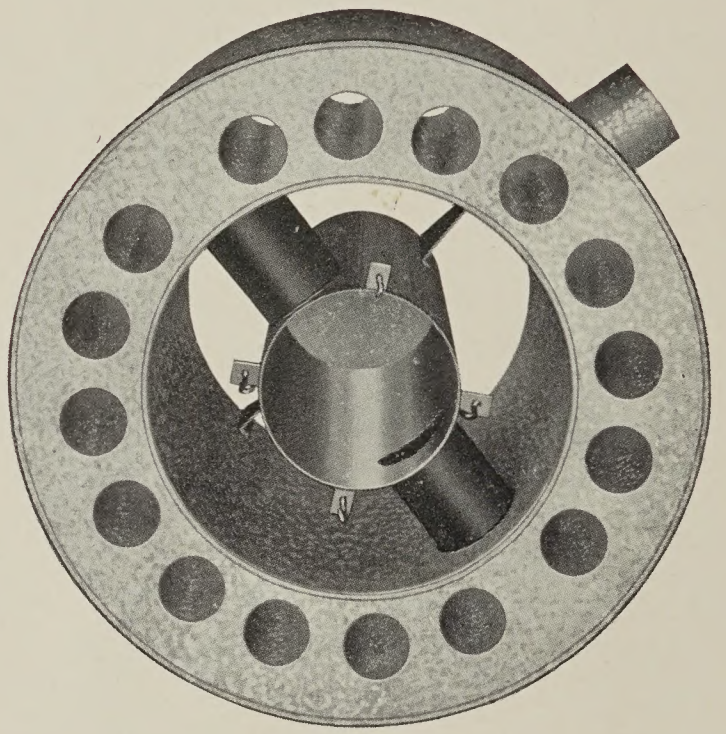
The Furnace is composed of a combustion chamber rectangular at the base and circular at the top. Above this is placed the radiating drum with its spiral fire travel and tube system of radiation. Surrounding these is a radiation shield. The entire furnace is enclosed in a galvanized casing surmounted by a dome which distributes the heated air evenly to all the warm air pipes.

Combustion Chamber. The combustion chamber is made of heavy sheet metal. It is welded throughout making it impossible for combustion gases to escape into the air passages. The furnace front is also solidly welded to the combustion chamber. This chamber is amply large so that the flames cannot overheat its sides, and thus insures long life in the furnace. Secondary air to support combustion enters through the front of the combustion chamber and is evenly distributed to all parts of the burners by the proper arrangement of perforated baffles.



PENNSYLVANIA'S Combustion Chamber

The outlet from the firechamber is equipped with a taper sleeve to which the radiator fits and is clamped.



Unit Heating Drum

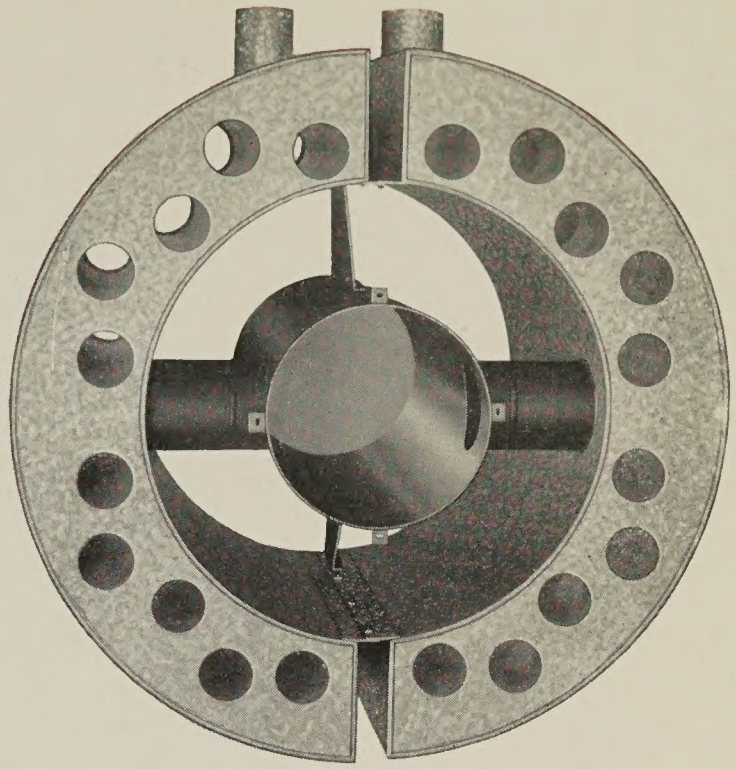
Radiating Drum. A bottom view of the radiating drum is shown on this page. The upper part of the combustion chamber is built into the drum and has two outlets through which the hot gases pass from the firechamber into the radiating drum.

In addition to the radiating surface provided by the firechamber and the inner and outer walls of the radiator this radiator is pierced with numerous vertical tubes which greatly increases the radiating surface in the furnace.

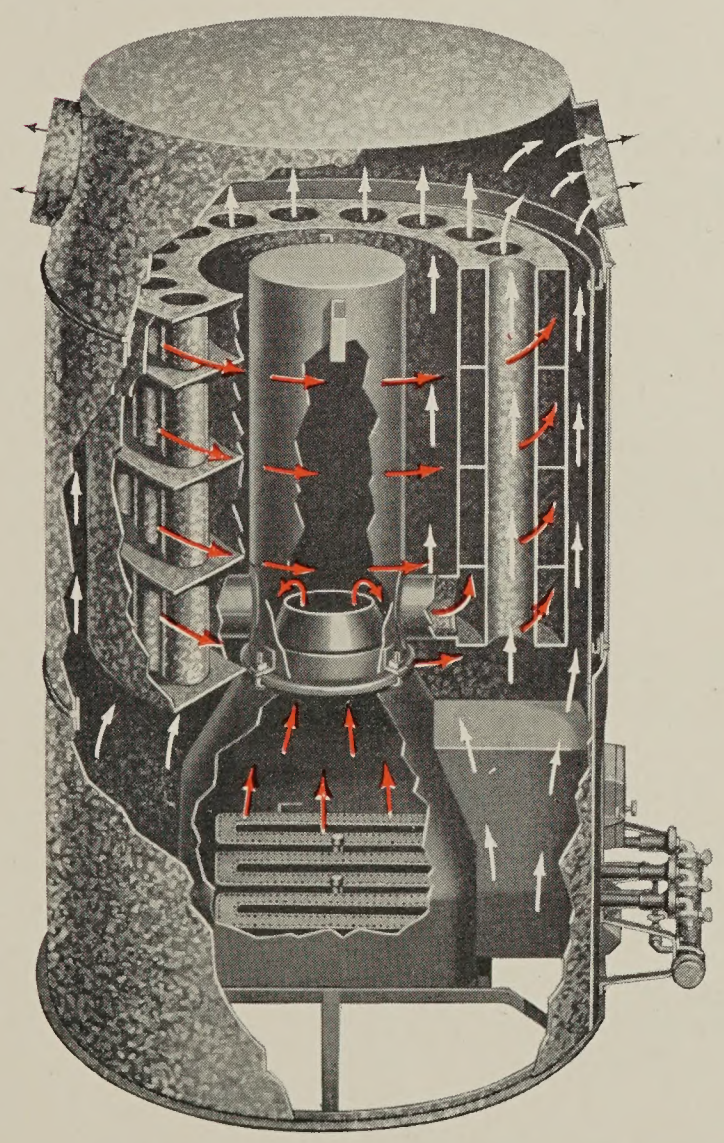
In the radiator these hot gases are passed completely around the radiator in three spirals making greater flue travel than is found in any other furnace manufactured today.

This spiral fire travel leads the gases continually upward and never downward. This feature is of the utmost importance. It insures quick starting of the furnace, freedom from smothering and eliminates condensation. This last is one of the reasons why the Pennsylvania Gas Furnace has the longest life of any gas furnace.

Divided Radiators. Because some basement door ways are narrow, the larger unit radiators will not go through them conveniently. For this reason the Number 16, 20, 24, 28 and 32 sizes may be ordered with either solid or divided radiating drums. The Number 36 and 40 sizes are furnished only in the divided type. The parts of the divided radiator are only half as wide as the unit, but when assembled have equal efficiency. The fire travel in the divided radiators is back and forth but continually upward.



Divided Heating Drum



SECTIONAL VIEW

That the design of the Pennsylvania Gas Furnace may be more clearly understood we show a cutaway section at the left. The red arrows show the travel of the hot gases as they leave the burners. They travel through the radiator in a spiral making three complete circuits through the drum but always upward. The white arrows indicate the travel of air being heated.

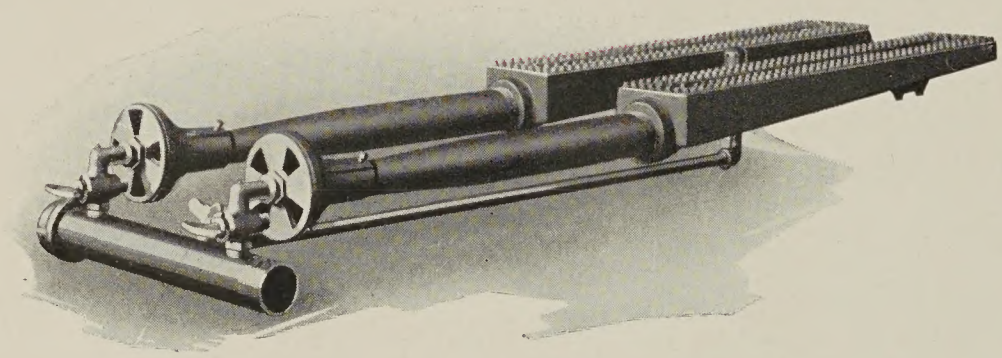
This view also shows the great amount of heating surface built into the radiator by means of the radiating tubes.

Burners. The burners are cast iron and scientifically designed. They are proportioned and arranged in each size of furnace for best results. The raised ports permit the proper amount of secondary air to reach each individual flame. Natural, artificial or mixed gas will give equally satisfactory results.

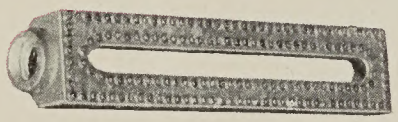
Each burner is equipped with an accurately formed mixing tube of venturi type and a special cast mixer with adjustable shutter.

Pilot Burners are furnished which light the main burners instantly and burn with a steady flame. The pilot burner heads are made of a special alloy which withstands the excessive heat without corrosion or decomposition.

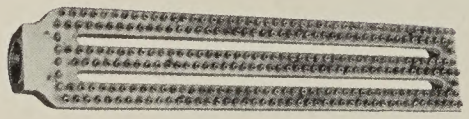
Automatic pilots are additional equipment furnished regularly with Class E and Class F furnaces as shown on page 9.



Burner Assembly on No. 16 PENNSYLVANIA Furnace



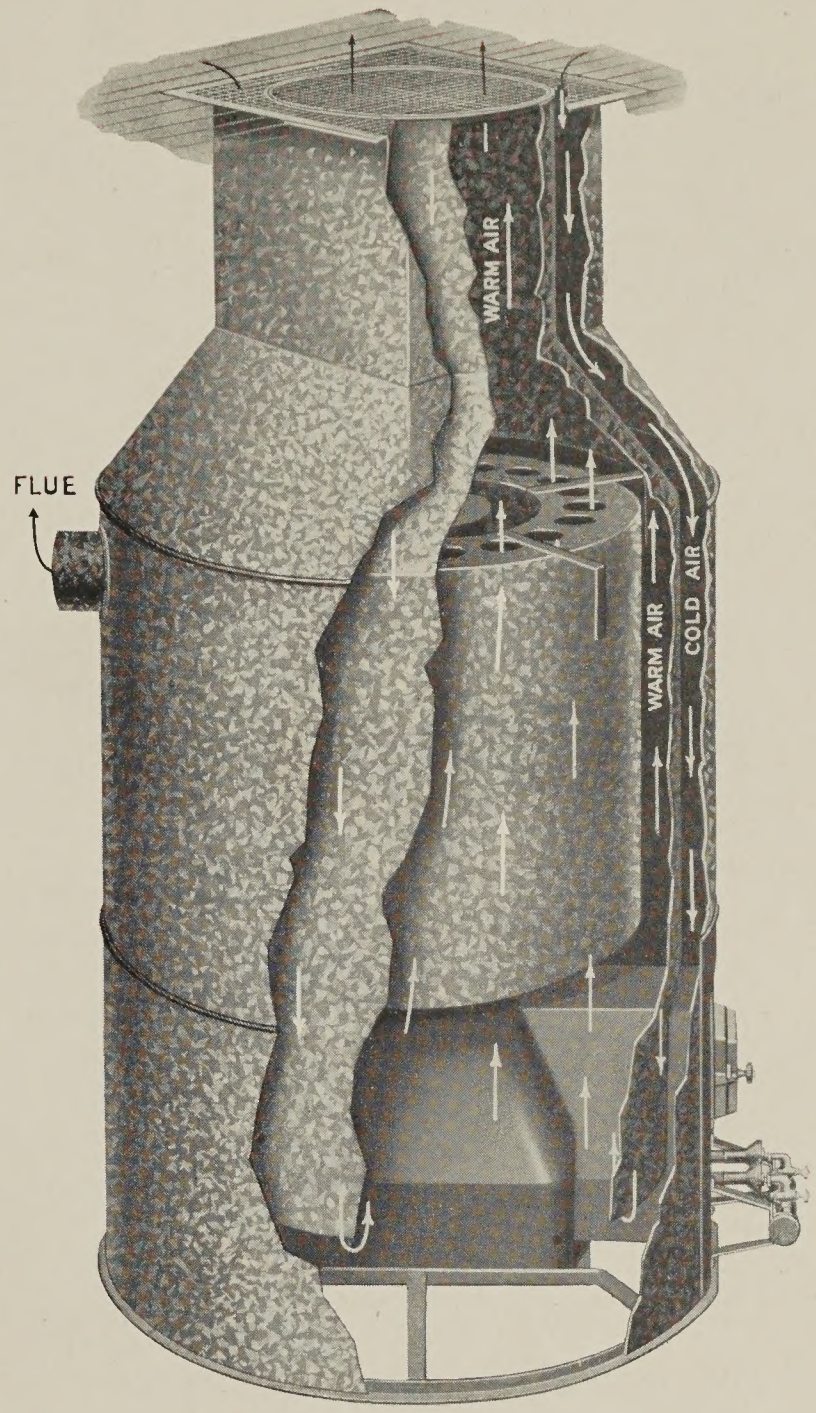
STYLE D



STYLE C

Two Styles of Cast Iron Burners Variously Combined in the Different Furnaces to Consume Gas According to Capacity Required.

Scientifically Correct Mixer and Venturi Tube.



Pipeless Furnace

This is also called the single pipe furnace. It is used frequently to heat large rooms such as stores, auditoriums, etc. The PENNSYLVANIA pipeless furnace is similar to the regular furnace, having the same combustion chamber and heating drum, but discharges the warm air through a single large pipe or duct which forms the inner casing.

A heavy cast-iron, two-part register is provided which separates the two linings, the warm air discharging through the center section.

The sleeve between the furnace and the register is made long enough to reach basement ceilings.

The furnace is complete in every respect. Only chimney and gas connections are required. Sizes and capacities are the same as given in the tables on page 8.

Capacities and Dimensions

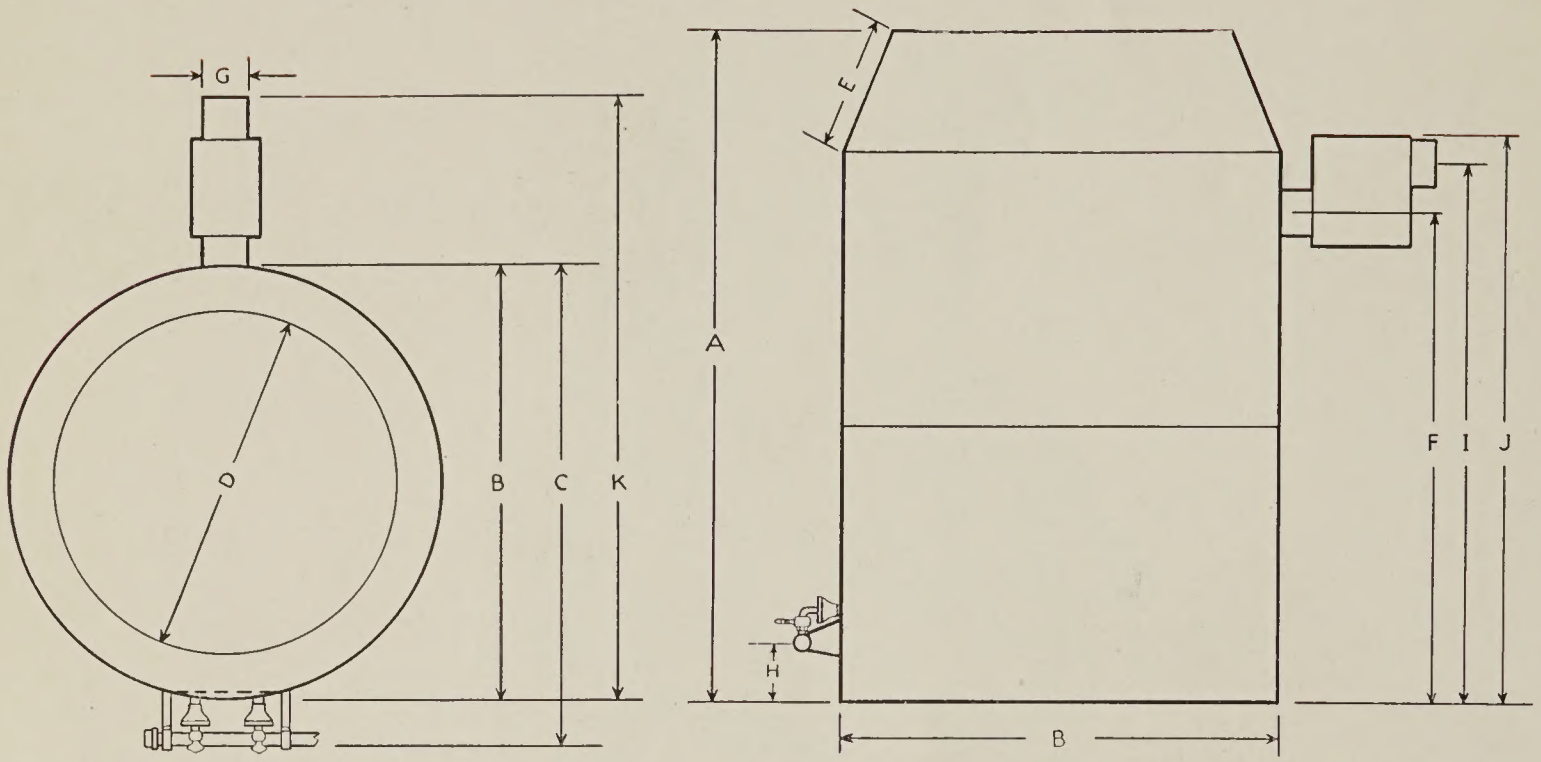


TABLE 1
FURNACE DIMENSIONS

Furnace No.	A	B	C	D	E	F	G	H	I	J	K	Gas Pipe Size	BURNERS No.	BURNERS Type	Smallest Opening Furnace Will Enter
12	63	31	35	25	10	47½	5	6¼	53½	56½	41	1	2	H	27 x 26
16	63	38	44	33	10	47	6	6¼	54	57½	55	1	2	D17	27 x 33
20	65	43	49	37½	11½	47	6	6¼	54	57½	58	1	2	C17	27 x 38
24	66	48	52¼	42½	12	47½	7	5¼	56	59½	66	1¼	2 1	D21 C21	27 x 43
28	67	53	55	47½	13	47½	7	5¼	56	59½	71	1¼	3	C21	27 x 48
32	73	58	63	51	15	51	8	5¼	56	60	79	1¼	3	C25	27 x 54
36	73	63	66	55	15½	52	8	5¼	58½	63½	84	1¼	2 2	D25 C25	32 x 56
40	73	68	73	59	15½	52	9	5¼	59	64	89	1¼	4	C25	33 x 62

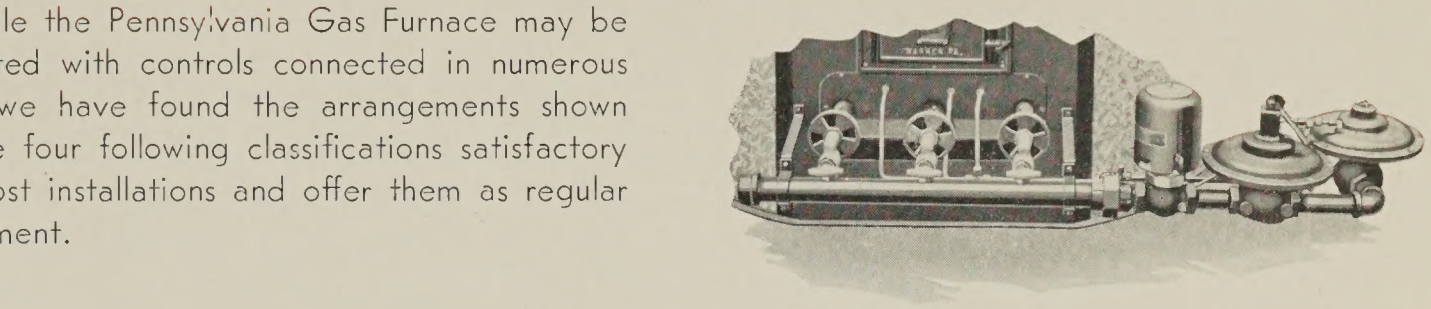
Dimensions are in inches.

TABLE 2
Capacities of Furnaces in B. T. U. per hour and Areas of basement Warm Air Pipes in sq. in.

Furnace No.	Heat Input B. T. U.	Heat Available at Furnace B. T. U.	Heat Available at Registers B. T. U.	BASEMENT PIPE AREAS										
				100% to First Floor	80% to First Floor 20% to Second Floor			60% to First Floor 40% to Second Floor			50% to First Floor 50% to Second Floor			100% to Second Floor
					First Floor	Second Floor	Total	First Floor	Second Floor	Total	First Floor	Second Floor	Total	
12	60,000	45,000	38,250	345	251	63	314	173	115	288	138	138	276	230
16	90,000	67,500	57,375	517	376	94	470	259	172	431	207	207	414	346
20	120,000	90,000	76,500	689	502	125	627	345	230	575	276	276	552	461
24	150,000	112,500	95,625	861	627	157	784	431	288	719	345	345	690	576
28	180,000	135,000	114,750	1,034	753	188	941	518	345	863	414	414	828	691
32	210,000	157,500	133,875	1,206	878	219	1,097	604	403	1,007	483	483	966	806
36	240,000	180,000	153,000	1,378	1,003	240	1,243	690	460	1,150	557	557	1,114	922
40	270,000	202,500	172,125	1,550	1,128	282	1,410	776	518	1,294	621	621	1,242	1,036

Classification of Controls

While the Pennsylvania Gas Furnace may be operated with controls connected in numerous ways we have found the arrangements shown by the four following classifications satisfactory for most installations and offer them as regular equipment.

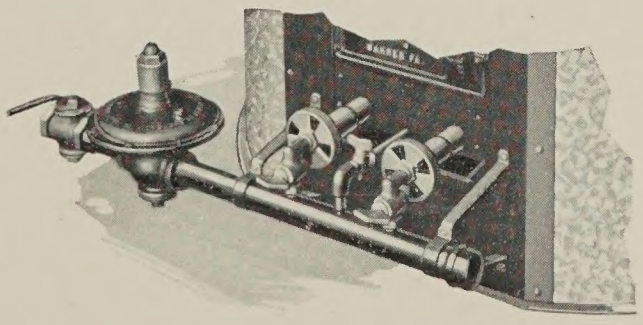


CLASS A

This is the basic model with hand controlled burner and pilot cocks. The manifold shown serves two burners and a single pilot. The number of burners and pilots varies with the size of the furnace as is shown in the table on page 8.

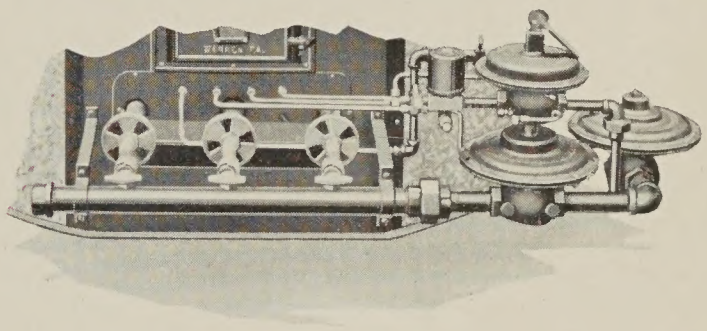
CLASS E

The equipment of a Class E furnace consists of a pressure regulator, special shut-off valve controlled by automatic pilot, and a motor valve for thermostatic control. These furnaces also are equipped with patented draft diverters and carry the AGA approval.



CLASS D

Class D Furnaces carry equipment required for approval by the AGA Testing Laboratory. This consists of main shut-off cock, pressure regulator and patented draft diverter.



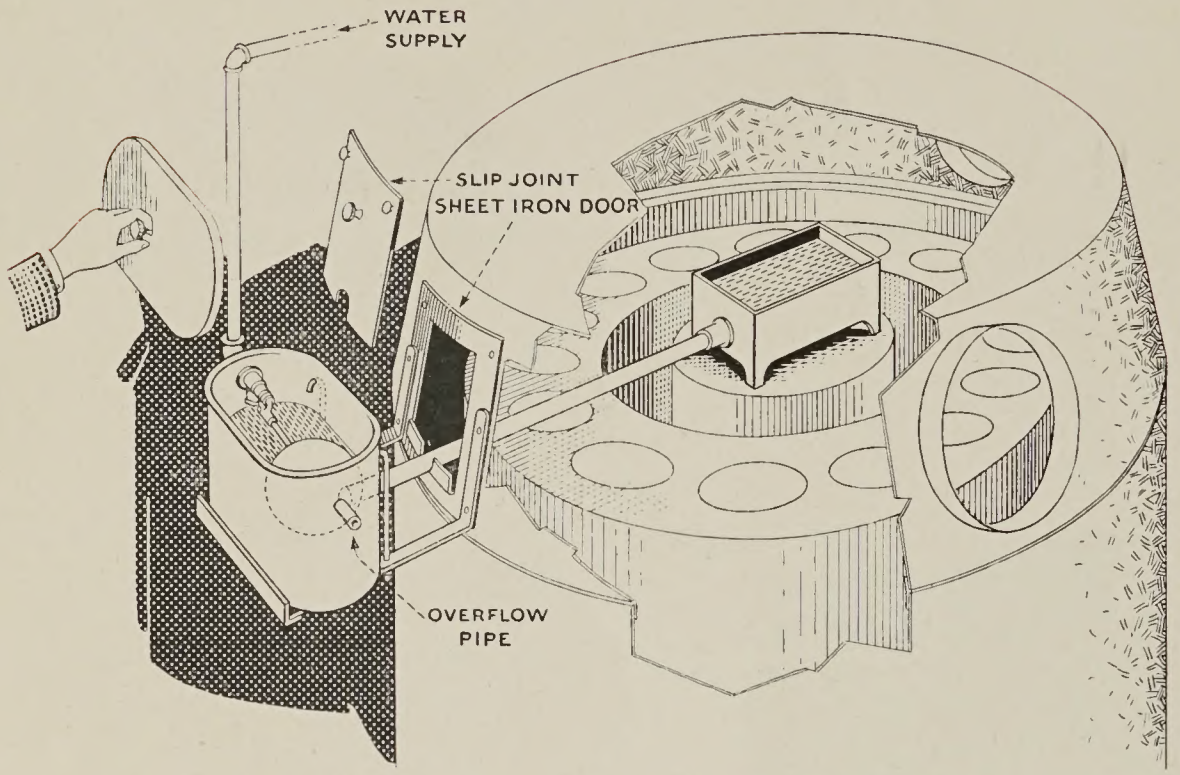
CLASS F

Our own design of gas actuated controls makes the Class F furnace fully automatic. It also carries AGA Laboratory approval.

The burners are served by a diaphragm valve controlled by a solenoid valve and a special automatic diaphragm shut-off valve which in turn acts on the main diaphragm control valve. A pressure regulator and patented draft diverter also are furnished with Class F Furnaces.

We recommend this class of controls for most satisfactory results.

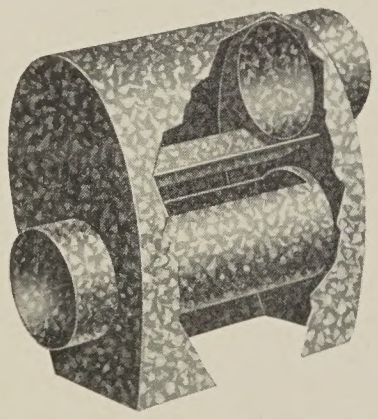
Humidity and Draft Control



This Shows the Installation of the PENNSYLVANIA Humidifier

HUMIDIFIER. Proper humidity is necessary for satisfactory heating and health. Colds, influenza, and other ailments may be traced to lack of proper humidity.

There are various ways of humidifying the air, but none more simple and satisfactory than that of the Pennsylvania Automatic Humidifier. The evaporating pan is located directly over the fire chamber in the plenum chamber and evaporates water in proportion to the amount of heat supplied. Water is supplied from the city water main through a float control box. No attention is required and no water is wasted. Both inner and outer pans are porcelain enameled to resist the action of water of various chemical content.



PENNSYLVANIA DRAFT DIVERTER (Patented). Chimney draft is a variable factor. Some chimneys have strong draft, in others it is weak. Often a chimney is subject to down draft. These variations have a decided effect on the combustion in the firechamber.

The Pennsylvania Draft Diverter corrects this. It is the most effective and positively operating draft diverter made. When the Pennsylvania Draft Diverter is attached to a furnace the flames are not affected by either strong up drafts or bad down drafts. It has been approved by the AGA Testing Laboratory.

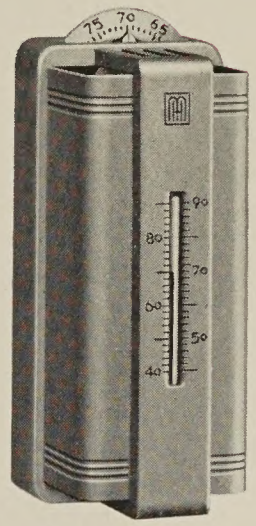
Another feature is the little headroom required for installation of this diverter. It actually takes less than one-fourth as much rise in the flue pipe as the ordinary vertical type of draft diverter.

The Pennsylvania Draft Diverter is a safety feature that should be installed on every Pennsylvania Furnace.

Other Optional Equipment

THERMOSTAT. The approved method of regulating room temperature is by means of a thermostat.

The thermostat is set at the temperature desired and through electrical connection with the electrical valve on the manifold regulates the gas supply to the burners to insure even temperature in the home and prevent waste of gas. Where automatic control is desired a thermostat must be used.



BLOWER. Some furnace installations have unequal runs of pipe or pipes that are exceptionally long. Or possibly it is desired to run the ducts against the basement ceiling to conserve head room. For this work the Model 30 Pennsylvania Furnace may be converted from a gravity furnace to a forced air system by the installation of a Pennsylvania Blower and motor unit. The Blower unit is installed on the cold air intake next to the furnace. A furnacestat located in the dome of the casing controls the operation of the blower automatically according to the amount of heat accumulated in the plenum chamber.

The Pennsylvania Blower unit is positive, efficient and noiseless, designed to deliver the required amount of air for each size of furnace.

FILTERS. Great quantities of dust, lint, and dirt are found in the air we breathe. In the home this air is heated as it circulates through the furnaces. The dust in passing over the heated surfaces is charred to soot and then finds its way to rugs, draperies, and house furnishings. The Pennsylvania Filter Unit is made of spun glass coated with adhesive. Air heated in the furnace is drawn through the filters where the dust and dirt is deposited and thus only clean pure air reaches the rooms. While the filter unit is particularly adapted to blower installations, it may be used with gravity heating but must be larger in size to provide greater filtering area. The filters are inexpensive and are thrown away when filled with dirt. This will mean changing them once or twice a season, depending on the dust conditions on each job.

THE MARK OF A. G. A. APPROVAL

Your Home Equipped With a PENNSYLVANIA GAS FURNACE is Comfortable, Clean and Modern

THE MARK OF PENNSYLVANIA QUALITY